

A galvanic cell has the following description: $\text{Mn(s)}|\text{Mn}^{2+}(\text{aq})||\text{Pb}^{2+}(\text{aq})|\text{Pb(s)}$

1. (4 pts) Write the overall reaction and half reactions, labeling oxidation and reduction.
2. (5 pts) Draw the battery, labeling the anode, cathode, solutions, and direction of ion and electron flow.
3. (3pts) Calculate the cell potential for this battery.
4. (3pts) Calculate dG for this battery.